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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09 578,798	05 23 2000	Jaime Poris	M-8555 US	5190

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EXAMINER

CHOI, WILLIAM C

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 12 31 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/578,798

Applicant(s)

PORIS, JAIME

Examiner

William C. Choi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 16 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 14-16 is/are allowed.
- 6) ☐ Claim(s) 1-4, 10, 17 and 19 is/are rejected.
- 7) ☐ Claim(s) 5-9, 11-13 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 16 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

Loha Ben
Primary Examiner

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

The indicated allowability of claims 17-19 are withdrawn in view of the newly discovered reference(s) to Kaisaki et al (U.S. 6,194,317 B1) in view of MCWAID et al (U.S. 2002/0174714 A1). Rejections based on the newly cited reference(s) follow.

Information Disclosure Statement

Receipt of the Information Disclosure Statement (IDS) with the copies of the references cited therein was received on October 16, 2002. An initialized copy of the IDS is enclosed with this office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 10, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaisaki et al in view of MCWAID et al.

In regards to claim 1, Kaisaki et al discloses a method of measuring the dishing (column 36, lines 13-17) of a first feature (Figure 2, "15") that is surrounded by a second feature (Figure 2, "16) on a substrate (Figure 2, "11"), said method comprising: measuring the height variation of a first feature on a substrate (column 36, lines 17-19), which would inherently correlate the height variation of the first feature with the height of the second feature to determine the amount of dishing of said first feature, this being reasonably assumed from the data of Table 5, but does not specifically disclose said method comprising: generating a set of calibration data for height variation correlation. Within the field of surface scanning techniques, MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of a surface (page 2, section [0011], lines 9-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of Kaisaki et al to comprise generating a set of calibration data for height variation correlation since MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of a surface.

Regarding claim 2, Kaisaki et al discloses wherein said measuring the height variation of said first feature is performed after a polishing process is used (column 35, lines 56-60).

Regarding claim 3, Kaisaki et al discloses wherein said first feature is a metal feature (column 8, lines 66-67, Figure 1, "14" and column 36, lines 15-17, Figure 2, "15")

and said second feature is a dielectric material (column 9, lines 6-9 and column 36, lines 15-17, Figure 2, "16", re "silicon dioxide" and column 3, lines 31-56).

Regarding claim 4, Kaisaki et al discloses wherein said metal feature comprises at least one of copper, aluminum, and tungsten (column 8, line 66 – column 9, line 4).

Regarding claim 10, Kaisaki et al discloses wherein measuring the height variation of said first feature comprises utilizing at least one of a differential interferometer and a laser displacement sensor to measure the shape of the first feature (column 12, lines 26-28).

In regards to claim 17, Kaisaki et al discloses a method of measuring dishing (column 36, lines 13-17) in a first feature (Figure 2, "15"), said method comprising: providing a substrate (Figure 2, "11") having a first feature (Figure 2, "15") embedded in a second feature Figure 2, "16"), said first feature and second feature having been polished to approximately planarize the top surface of said first feature and said second feature (column 3, lines 31-56, Figure 2); measuring the height variation of said first feature to determine the profile shape of said first feature (column 36, Table 5); inherently comparing said height variation of said first feature with the height of said second feature, which relates the magnitude of dishing to the profile shape of a first feature, this being reasonably assumed from the data of table 5, but does not specifically disclose pre-generated calibration data for first feature height variation comparison. Within the field of surface scanning techniques, MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of a surface (page 2, section [0011], lines 9-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of Kaisaki et al to comprise pre-generated calibration data for first feature height variation comparison since MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of a surface.

Regarding claim 19, Kaisaki et al discloses wherein measuring the height variation of said first feature comprises utilizing at least one of a differential interferometer and a laser displacement sensor to measure the shape of the first feature (column 12, lines 26-28).

Allowable Subject Matter

Claims 14-16 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 14-16: a method of producing a set of calibration data as claimed specifically wherein the first features of at least one sample substrate has differing widths and said method comprises relating the magnitude of dishing to at least one of the first feature widths and the profile shape of the first features.

Claims 5-9, 11-13 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 5-9: a method of measuring the dishing as claimed specifically wherein generating a set of calibration data comprises providing a set of sample substrates having different values of first feature widths and producing calibration data by relating the measured dishing to different values of first feature widths.

The prior art fails to teach a combination of all the claimed features as presented in claims 11-13: a method of measuring the dishing as claimed specifically wherein measuring the height variation of said first features comprises interpreting said height variation as the shape of said first feature and correlating the height variation of said first feature with said calibration data comprises correlating said shape of said first feature with said calibration curves to determine the amount of dishing of said first feature.

The prior art fails to teach a combination of all the claimed features as presented in claim 18: a method of measuring dishing in a first feature as claimed specifically further comprising determining the width of said first feature, wherein said pre-generated calibration data further relates the magnitude of dishing to the first feature width.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (703) 305-


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3100. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

W-C-
William Choi
Patent Examiner
Art Unit 2873
December 23, 2002


Loha Ben
Primary Examiner